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A potentiometric DNA sensor for determining autoimmune antibodies to DNA

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Abstract

A new technique is proposed for detecting interactions between DNA and DNA autoimmune antibodies using a potentiometric sensor based on a glassy-carbon electrode modified with polyaniline and native DNA from chicken erythrocytes. It is shown that the DNA-antibody interaction changes the rate of polyaniline doping in transferring the DNA sensor from an alkaline (pH 7.5) solution, which is optimum for the immunochemical reaction, to an acidic (pH 3.0) solution. The dynamics of the variation of the DNA sensor potential depends on the titer of antibodies and their origin. The dependence of the DNA sensor signal on the dilution of the blood sera from systemic lupus erythematosus and autoimmune thyroiditis patients shows that DNA antibodies can be diagnosed by the characteristic maximum in the dilution curve found in the range of serum dilutions from 1: 20 to 1: 50.

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